PSYCHE.

NOTES ON THE WINTER INSECT FAUNA OF VIGO COUNTY, INDIANA. — II.

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Vigo County lies on the western border of Indiana, and almost midway between the northern and southern boundaries of the State. The topography of the county is varied. The Wabash River flows through its northwestern corner and in many places its bottoms, which are usually overflowed each spring, are from two to four miles in width.

Bordering these lowland bottoms are level river terraces or prairies varying in width from three to eight miles, the soils of which for a half mile or more are exceedingly sandy, but lose this character as one proceeds farther away from the lowlands. Beyond the prairies are the uplands, usually more or less broken or hilly, which extend to the confines of the county, and are underlaid with coal. I mention these facts because observation has led me to believe that the insect fauna of any region is determined largely by its topography and soils, as well as by its latitude, temperature, etc.

My collecting, especially that of winter, has mostly been within a radius of ten miles of the city of Terre Haute, and largely along the hillsides where the bottoms and prairies, or the prairies and uplands meet.

About 160 species of Hemiptera-Heteroptera have been taken in the county, but I believe that this number by no means exhausts the fauna of this suborder existing there, as such species only have been taken as have come to hand while searching for other forms. Of these, two-fifths, or 64 species, have been taken in the winter months.

Thirty-eight of the sixty-four are listed in the present paper, and brief notes as to the places which they occupy in winter are given. The remaining species, — from the Lygaeidae onward, will be treated of in a future article.

The arrangement and nomenclature is that of Uhler's "Check-List of the Hemiptera-Heteroptera of North America," to the author of which, Mr. P. R. Uhler of Baltimore, Md., I am under many obligations for aid in determining the species of Heteroptera which inhabit the county.

In addition to the 64 species of this suborder taken by myself in winter, Mr. E. P. Van Duzee, in his recent "List of the Hemiptera of Buffalo and

Vicinity," mentions 13 other species taken by him in that season, in the vicinity of Buffalo, New York. It is probable, therefore, that, in the northeastern United States, fully 100 species of Heteroptera survive the winter as imagoes.

HEMIPTERA-HETEROPTERA.

Corimelaenidae.

1, *Corimelaena atra* Am. et Serv. Found singly beneath logs and the leaves of mullein (*Verbascum thapsus* L.) Dec. 10–Feb. 25.

2. *Corimelaena pulicaria* Germ. Beneath rails and dead leaves in fence corners (Feb. 11–Feb. 25).

Cydnidae.

3, *Amnestus pusillus* Uhler. One specimen, the only one seen in the State, was taken from an overturned log on a sandy hillside (Dec. 23).

Pentatomidae.

4, *Podisus spinosus* Dallas. Not a common species in Western Indiana. Hibernates beneath the leaves of mullein, etc. (Jan. 5–Feb. 11.) The "soldier bug" seems to have a fondness for a diet of butterfly larvae, as a specimen was taken in June feeding upon a caterpillar of *Danais archippus* Fab., and another in November on one of *Papilio cresphontes* Cram.

5, *Podops cinctipes* Say. Frequent in winter beneath chunks on sandy hillsides.

6, *Brochymena annulata* Fab. This, the common member of the genus with us, is found throughout the winter in small colonies of three to a dozen huddled closely together beneath the loose bark of dead black walnut and ash trees. When, even on a warm day, the protective cover of bark is removed, they remain perfectly motionless, with antennae invisible on account of being folded back close alongside the beak beneath the head and body.

7, *Mormidea lugens* Fab. Rare in winter beneath chunks and the leaves of mullein (Dec. 10–Jan. 25). Common in summer on mullein, and on one occasion (Oct. 16), thousands were seen crawling over the leaves and stems of the Strawberry Bush (*Euonymus americanus* L.).

8, *Euchistus tristigmus* Say. Hibernates singly beneath logs and chunks, especially those with sides deeply buried in vegetable mold (Dec. 12–Feb. 14).

9, *Euchistus ictericus* L. Singly beneath radical leaves of mullein, and beneath leaves and pieces of rail in fence corners.

10, *Hymenarcys aequalis* Say. In winter a common and gregarious species beneath logs, mullein leaves, etc. — especially in sandy soil. In one instance 50 or more were found huddled together in one bunch. The nymphs are also rarely found in winter.

11, *Hymenarcys nervosa* Say. Rare in winter beneath logs and stones near the borders of woods and cultivated fields (Feb. 6–8).

12, *Thyanta custator* Fab. An uncommon species in Western Indiana, and varying much in color through different shades of green and olive brown. Taken in January on three occasions from beneath the radical leaves of mullein.

13, *Nezara hilaris* Say. In Vigo County this handsome Pentatomid reaches maturity about the middle of August, and a few individuals undoubtedly survive the winter, as I have taken it in two instances on sunny days in the first half of March from the branches of shrubs, but have never happened upon it during my winter collecting.

Coreidae.

14. *Anasa tristis* DeGeer. This common and disgusting insect hibernates in numbers beneath the loose bark of stumps and snags of various kinds. Often a score or more will be found occupying a space a foot square beneath the bark. Many of them die before spring, especially if the winter is an open one with alternate freezing and thawing, but there are always plenty left for "seed." They have been found in winter a mile and more away from any spot where squash or kindred plant was grown the season before — showing that distance does not deter them from securing a hibernaculum to their liking.

15, *Ceraleptus americanus* Stål. But three specimens of this insect have been taken in the county. They were found beneath chunks, in sandy soil, on Dec. 10, March 11, and March 28, respectively. In general appearance it resembles a diminutive "squash bug."

Berytidae.

16. *Jalysus spinosus* Say. Singly beneath logs and mullein leaves on a number of occasions during the winter months.

17, *Harmostes reflexulus* Say. Beneath mullein leaves, (Dec. 10–Jan. 13). Frequents flowers of yarrow (*Achillea millefolium* L.) in June.

18, *Corizus hyalinus* Fab. A common winter insect beneath mullein leaves, chips, chunks, etc. Usually several are found in close proximity.

Lygaeidae.

19, *Nysius angustatus* Uhler. Beneath boards and chunks along the borders of cultivated fields (Dec. 3–Jan. 6).

20, *Ischnorhynchus didymus* Zett. Rare. Singly beneath logs near the edges of woods (Jan. 13).

21, *Cymodema tabida* Spin. Rare. But two specimens taken in the county. Beneath logs in open woods (Nov. 30–Dec 18).

22, *Blissus leucopterus* Say. Too common. Gregarious. Hibernates beneath chunks and mullein leaves, especially along borders of cultivated fields; also within small crevices in bottom rails of fences; between the root leaves and stems of sedges, grasses, etc., etc.

23, *Geocoris discopterus* Stål. Taken on two occasions in winter

from beneath mullein leaves (Jan. 5–Feb. 20).

24, *Geocoris fuliginosus* Say. Frequent. Singly or in pairs beneath logs and chunks along roadsides.

25, *Ligyrocoris constrictus* Say. Rare. Beneath logs (Dec. 10).

26, *Myodocha serripes* Oliv. One of the most common of our winter Hemiptera. Found beneath logs, chunks, decaying leaves, etc., especially in dry sandy soil in upland woods. Seldom more than two are found together though sometimes gregarious. When their protective shelter is disturbed, unless benumbed with cold, they crawl hurriedly away, their slender neck and long swinging antennae giving them an odd appearance as they go. Occasionally the last two nymph stages are found in mid-winter.

27, *Pamera basalis* Dallas. Rather common throughout the winter beneath logs, stones, and rubbish along the borders of cultivated fields.

28, *Ozophora picturata* Uhler. The only specimen in my collection was taken from beneath a log on a sandy hillside, Dec. 3.

29, *Ptochiomera nodosa* Say. Very common beneath chunks along the borders of open fields.

30, *Cnemodus mavortius*, Say. An uncommon species but taken on several occasions in winter from beneath logs in damp localities. Usually two in a place.

31, *Trapezonotus nebulosus* Fall. Quite common beneath rubbish along the borders of sandy fields, especially those in which melons had been cultivated (Dec. 4–Feb. 1).

32, *Emblethis arenarius* Linn. Frequent; especially so beneath mullein leaves (Dec. 10–Jan. 25).

33, *Peritrechus fraternus* Uhl. Rare. Beneath chips and dead leaves on the side of high sandy hill (Feb. 14–Feb. 21).

34, *Megalonotus unus* Say. I have taken this insect on but two occasions. March 21, 1893, I found ten occupying a space of a few square inches beneath a rail near the border of an upland woods. They feigned death when disturbed. On Dec. 23, an additional specimen was secured from beneath a log on a sandy hillside.

35, *Microtoma carbonaria* Rossi. Common. Hibernating singly or in pairs, beneath logs, chunks, leaves of mullein, etc.

36, *Peliopelta abbreviata* Uhler. Rare. Two were taken from beneath a chunk on roadsides, Dec. 23.

37, *Lygaeus turcicus* Fab. Common throughout the winter, both as nymph and imago, beneath logs and mullein leaves along the sandy border of the old Wabash and Erie canal, where its food plant the common milkweed (*Asclepius cornuti* Decaisne) grows in abundance.

38, *Lygaeus reclivatus* Say. This form, distinguished from the above only by the white spots on the membranes of the wing covers, is much less common in winter. It frequents the same localities as *L. turcicus*, and I doubt whether the two are distinct, though Uhler treats them as so in his Catalogue, and named them as so for me.